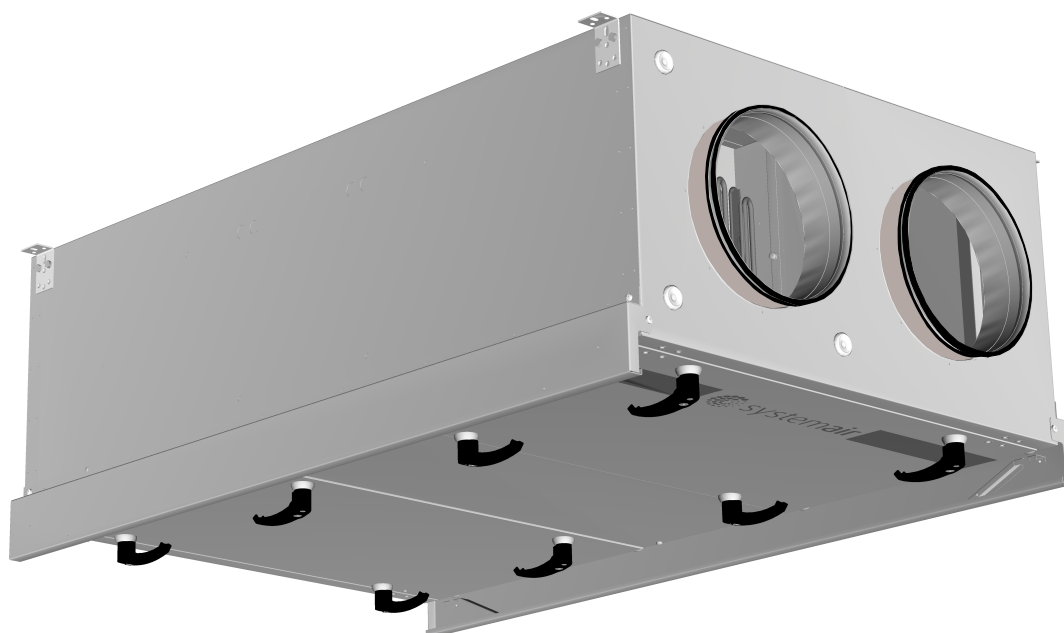


Topvex FR03, FR06, FR08, FR11

Compact Air Handling Unit



GB Installation instructions

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1 Declaration of Conformity

Manufacturer



Systemair AB
Industrivägen 3
SE-739 30 Skinnskatteberg SWEDEN
Office: +46 222 440 00 Fax: +46 222 440 99
www.systemair.com

hereby confirms that the following products:

Air handling units

Topvex FR03	Topvex FR08
Topvex FR03 EL	Topvex FR08 EL
Topvex FR03 HWL/HWH	Topvex FR08 HWL/HWH
Topvex FR06	Topvex FR11
Topvex FR06 EL	Topvex FR11 EL
Topvex FR06 HWL/HWH	Topvex FR11 HWL/HWH

(The declaration applies only to product in the condition it was delivered in and installed in the facility in accordance with the included installation instructions. The insurance does not cover components that are added or actions carried out subsequently on the product)

Comply with all applicable requirements in the following directives

- **Machinery Directive 2006/42/EC**
- **Low Voltage Directive 2006/95/EC**
- **EMC Directive 2004/108/EC**

The following harmonized standards are applied in applicable parts:

EN ISO 12100-1	Safety of machinery – Basic concepts, general principles for design – Part 1: Basic terminology, methodology
EN ISO 12100-2	Safety of machinery – Basic concepts, general principles for design – Part 2: Technical principles
EN ISO 14121-1:2007	Safety of machinery – Risk assessment – Part 1: Principles
EN 13857	Safety of machinery – Safety distances to prevent hazard zones being reached by upper or lower limbs
EN 60 335-1	Household and similar electrical appliances – Safety Part 1: General requirements
EN 60 335-2-40	Safety of household and similar electrical appliances - Part 2-40: Particular requirements for electrical heat pumps, air-conditioners and dehumidifiers
EN 50 106	Safety of household and similar appliances – Particular rules for routine tests referring to appliances under the scope of EN 60 335-1 and EN 60967
EN 60 529	Degrees of protection provided by enclosures (IP Code)
EN 61000-6-2	Electromagnetic compatibility (EMC) – Part 6-2: Generic standards – Immunity for industrial environments
EN 61000-6-3	Electromagnetic compatibility (EMC) – Part 6-3: Generic standards – Emission standards for residential, commercial and light-industrial environments

The complete technical documentation is available.

Skinnskatteberg, 31–10–2011



Mats Sándor
Technical Director

2 Warnings

The following admonitions will be presented in the different sections of the document.

Danger

- Make sure that the Mains supply to the unit is disconnected before performing any maintenance or electrical work!
- All electrical connections must be carried out by an authorized installer and in accordance with local rules and regulations.

Warning

- The door handles are only intended to be used during the installation. Handles must be removed before the unit is put into operation to ensure the required level of safety for the unit.
- The unit must be duct connected or in some other way provided with protection so that it is not possible to come in contact with the fans through the duct connections
- The unit is heavy. Be careful during transport and mounting. Risk of injury through pinching. Use protective clothing.
- Beware of sharp edges during mounting and maintenance. Make sure that a proper lifting device is used. Use protective clothing.
- The units electrical connection to the mains supply must be preceded by an all pole circuit breaker with a minimum 3 mm gap.

Important

- If the unit is installed in a cold place make sure that all joints are covered with insulation, and tape well
- Duct connections/duct ends should be covered during storage and installation
- Do not connect tumble dryers to the ventilation system
- Take care not to damage the water battery when connecting water pipes to connectors. Use a spanner to tighten the connection.

3 Product Information

3.1 General

This installation manual concerns air handling unit type Topvex FR manufactured by Systemair AB. Topvex FR include the following model options:

- **Model:** FR03, FR06, FR08, FR11
- **Heating coil:** **EL** (Electric), **HWL** (Water coil, low power), **HWH** (Water coil, high power) or **None**.
- **Right or left models:** **R** (Right) **L** (Left). The side where the supply air is located when viewed from the access side.
- **Airflow control:** **CAV** (Constant Air Volume), **VAV** (Variable Air Volume = Constant duct pressure control)

Water heating battery can be ordered as an accessory to units without re-heater.

This manual consists of basic information and recommendations concerning the design, installation, start-up and operation, to ensure a proper fail-free operation of the unit.

The key to proper and safe operation of the unit is to read this manual thoroughly, use the unit according to given guidelines and follow all safety requirements.

3.2 Technical Data

3.2.1 Dimensions

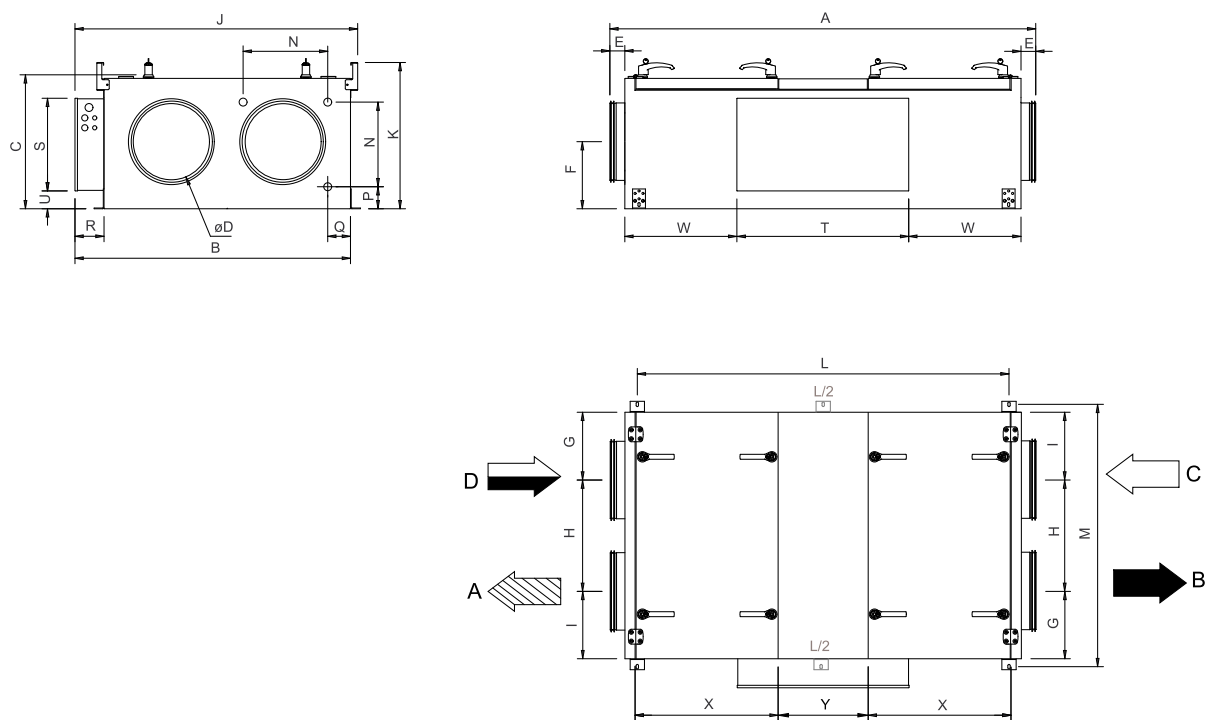


Fig. 1 Dimensions (mm) Topvex FR03–11 (drawn as a left hand unit)

Arrow symbol description (table 3).

Table 1: Dimensions

Model	A	B	C	D	E	F	G	H	I	J	K	L
FR03	1720	1115	540	ø315	60	270	275	450	275	1145	590	1502
FR06	2160	1315	640	ø400	80	275	325	550	325	1345	705	1902

Dimensions cont'd

Model	A	B	C	D	E	F	G	H	I	J	K	L
FR08	2230	1515	740	ø500	60	355	350	650	400	1545	790	2004
FR11	2440	1715	840	ø630	80	405	400	765	432	1745	904	2206

Model	L/2	M	N	P	Q	R	S	T	U	W	X	Y
FR03	-	1050	388	64	68	120	375	695	72	456	576	358
FR06	951	1260	414	103	106	102	375	695	158	653	763	384
FR08	1002	1450	514	103	106	120	375	695	275	706	807	384
FR11	1103	1650	614	103	106	120	375	695	329	801	844	520

3.2.2 Weights

Model	Weight (kg)
FR03	179
FR06	256
FR08	345
FR11	460

3.2.3 Space required

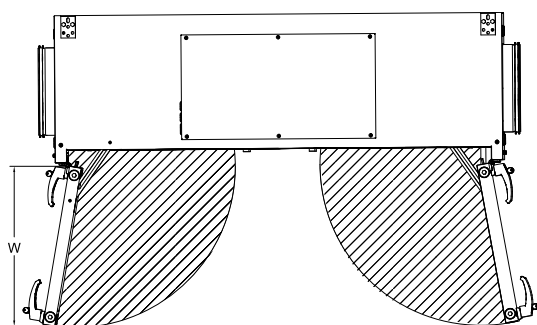


Fig. 2 Space required

Model	W (mm)
FR03	576
FR06	763
FR08	807
FR11	844

In case the sliding door application is installed the required space corresponds to the height of the sliding door support bars (50 mm).

3.2.4 Electrical data

Table 2: Power Consumption

Model	Fans (W tot.) 230V 1~ and 400 V 3N~	Fans (W tot.) 230V 3~	El Heating battery (kW tot.)	Fuse (mains) (A) for 230V 1~ and 400 V 3N~	Fuse (mains) (A) for 230V 1~ and 230V 3~
FR03 EL	954	954	5	3x16	3x20
FR03 (None, HWL/HWH)	954	–	–	10	10
FR06 EL	1882	1882	10	3x20	3x35
FR06 (None, HWL/HWH)	1882	1882	–	3x10	3x10
FR08 EL	1944	1944	12	3x25	3x40
FR08 (None, HWL/HWH)	1944	1944	–	3x10	3x10
FR11	5666	6142	15	3x35	3x63
FR11 (None, HWL/HWH)	5666	6142	–	3x10	3x20

3.3 Transport and storage

The Topvex FR03–11 should be stored and transported in such a way that it is protected against physical damage that can harm panels, handles, display etc. It should be covered so that dust, rain and snow cannot enter and damage the unit and its components. The appliance is delivered in one piece containing all necessary components, wrapped in plastic on a pallet for easy transportation.

When transporting the FR03 unit use a fork lift placed on the gable of the unit (figure 3). Topvex FR06, FR08, and FR11 have specially constructed pallets that allow lifting at the long side of the unit (figure 4). These models can alternatively be lifted using 2 fork lifts from the gable sides.



Warning

The unit is heavy. Be careful during transport and mounting. Risk of injury through pinching. Use protective clothing.

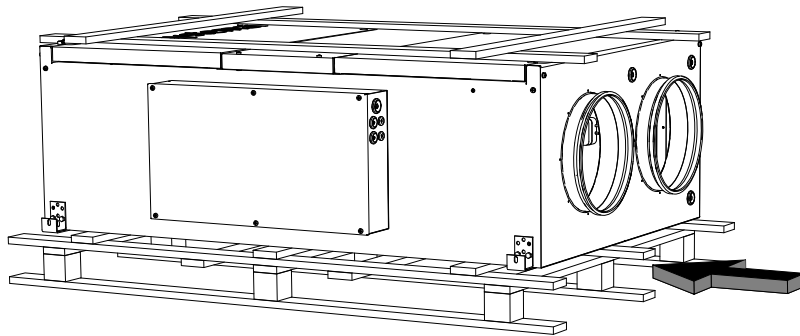


Fig. 3 Transporting the unit

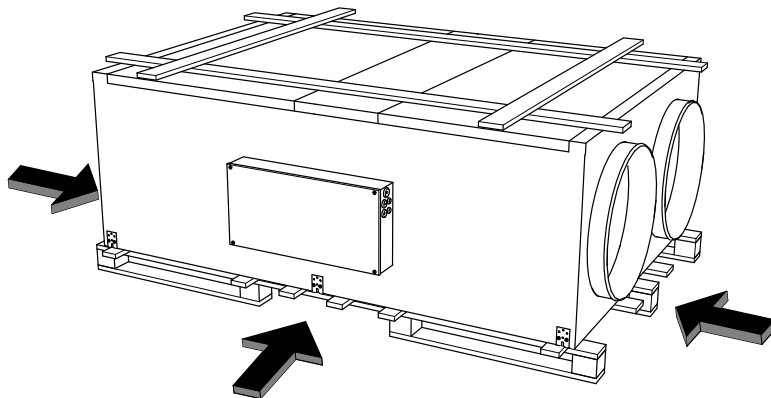


Fig. 4 Transporting units FR06–11

4 Installation

4.1 Unpacking

Topvex FR03–11 are delivered on a pallet (figure 3 and figure 4). Necessary components like handles and supply air temperature sensor are placed inside the unit.

The inspection hatches are opened by the use of a 16 mm cap key (figure 5). To facilitate opening and closing of the inspection hatches apply the 8 handles that are placed inside the unit on delivery.

After completed installation the handles need to be removed to prevent unauthorized opening of the unit.

Verify that all ordered equipment are delivered before starting the installation. Any discrepancies from the ordered equipment must be reported to the supplier of Systemair products.

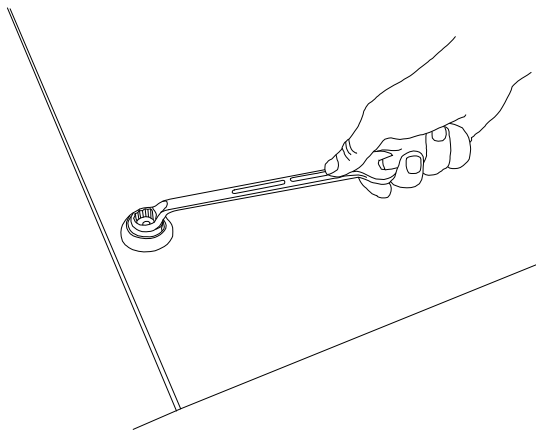


Fig. 5 Opening inspection hatches with a cap key

4.2 Where/how to install

The unit is meant for indoor installation. The electronic components should not be exposed to lower temperature than 0°C or higher than +50°C.

When mounting; make sure to leave enough space to access the service doors (figure 2).

Note:

If there is not sufficient space to open the inspection doors it is possible to unscrew the hinges to remove the doors completely for inspection and maintenance. Another option, when installing the unit suspended with the inspection door facing downwards, is to acquire the sliding door accessory kit.

Avoid placing the unit against a wall, as low frequency noise can cause vibrations in the wall.

The outdoor air intake of the building should if possible be put in the northern or eastern side of the building and away from other exhaust outlets like kitchen fan outcasts or laundry room outlets. The extract air should ideally be led out via a roof cowl away from any outdoor air intakes, windows, balconies etc.



Warning

- The door handles are only intended to be used during the installation. Handles must be removed before the unit is put into operation to ensure the required level of safety for the unit.
- The unit must be duct connected or in some other way provided with protection so that it is not possible to come in contact with the fans through the duct connections

4.3 Installing the unit

The unit can be installed in the following positions

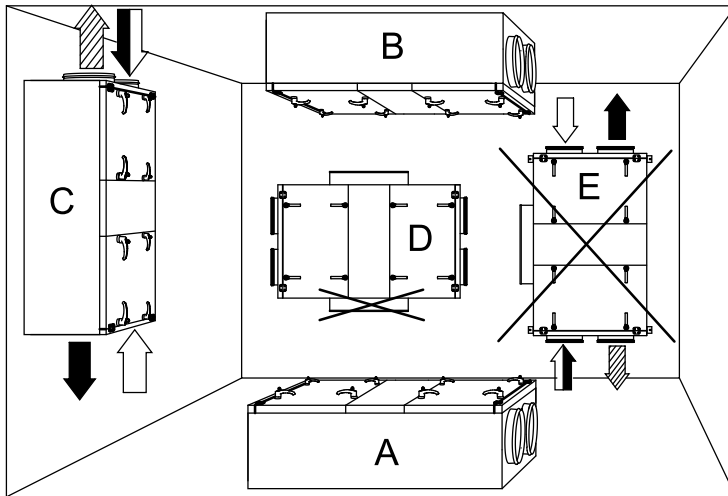


Fig. 6 Possible installation positions

Position	Description
A	Installation flat on the ground. Left and right connections are possible.
B	Ceiling installation. Left and right connections are possible.
C	Vertical wall installation with the supply air upward.
D	Horizontal wall installation Left and right connections are possible.
	Note: The unit may not be installed with the electrical connection box facing downward!
E	Vertical wall installation with the supply air downward, not allowed .

Arrow symbol description (table 3).

Installation according to A-D

1

Prepare the surface where the unit is to be mounted. Make sure that the surface is flat, levelled and that it supports the weight of the unit. Perform the installation in accordance with local rules and regulations.

2

Lift the unit in place.



Warning

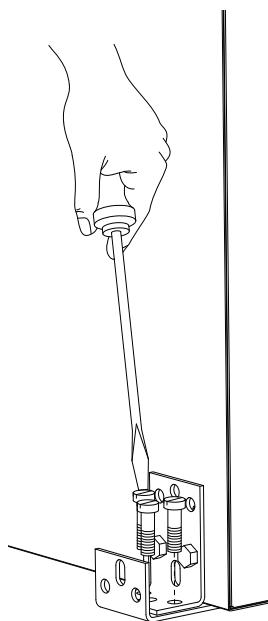
Beware of sharp edges during mounting and maintenance. Make sure that a proper lifting device is used. Use protective clothing.

3

Install the unit by the use of the mounting brackets fitted on the unit on delivery.

Note:

If the unit is installed in the ceiling or on the wall assure that the unit is pressed tightly to the mounting surface before fastening the mounting brackets. Make sure to use proper fastening device (screw/bolts) considering the weight of the unit and the type of surface it is fitted to. The installation can only be performed by an authorized installer.



Double mounting brackets (pos. 1 and 2, figure 7) are used for TopvexFR06–11 to ensure a stable fit. TopvexFR03 have single brackets (pos. 1).

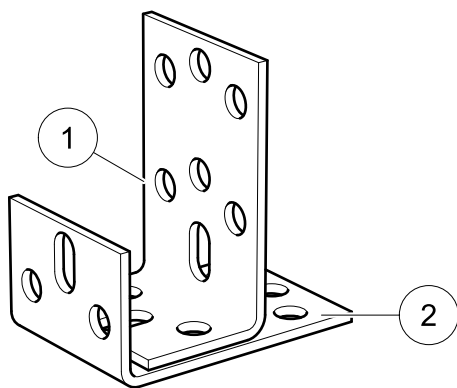


Fig. 7 Mounting brackets

4.4 Supply air sensor

The supply air sensor is fitted in the duct ca. 3 m after the unit in the supply air duct (figure 8). Connect the sensor to terminal 30–31 (table 4) in the electrical connection box. Other temperature sensors are built in to the unit from factory. The supply air sensor is enclosed in the unit package on delivery

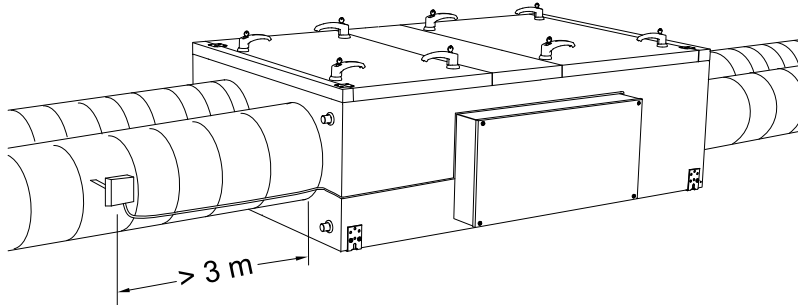


Fig. 8 Installed supply air sensor

4.5 Installation of VAV models

If the unit is delivered as a VAV (Variable Air Volume) unit the pressure transmitters controlling the fan speeds are delivered loosely with the unit. The pressure transmitters need to be mounted in the supply and extract air ducts (figure 9) and connected to terminals 40–42 (table 4) in the electrical connection box.

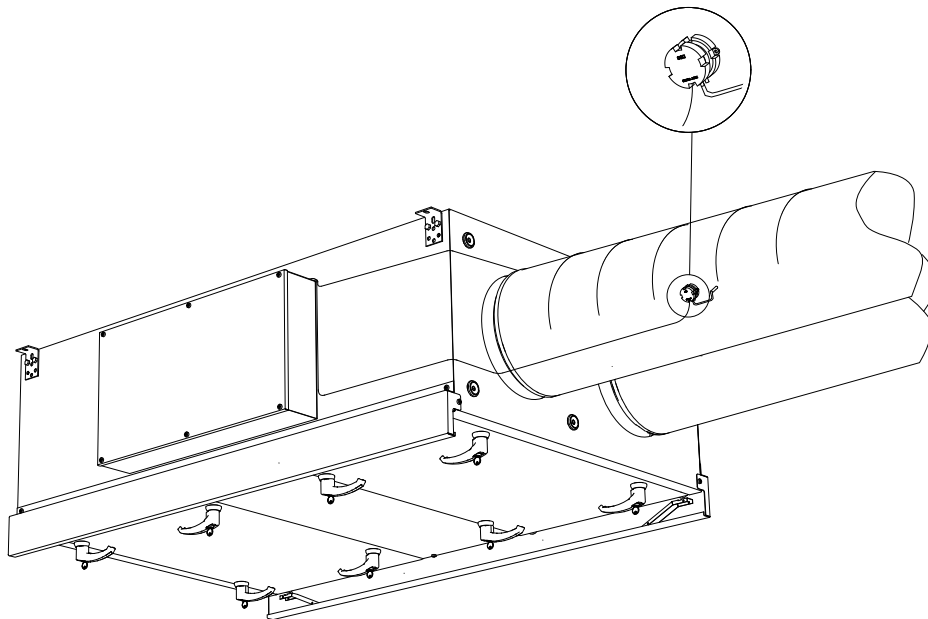


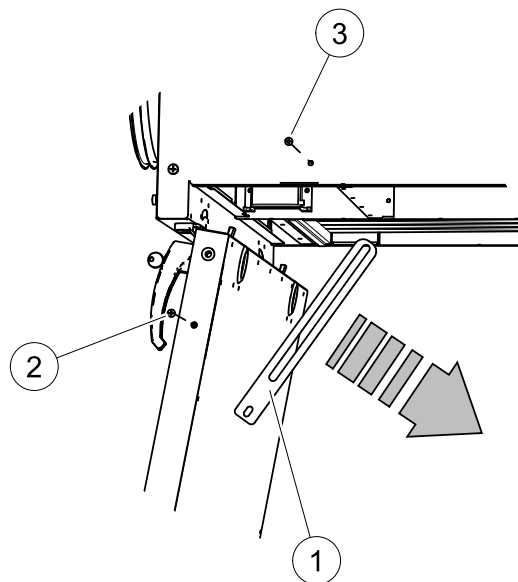
Fig. 9 VAV installation

4.6 Mounting the Sliding door kit

A sliding door kit for the inspection doors can be acquired as an accessory and can be mounted on units, which are installed with the inspection doors facing downward, e.g. in false ceiling installation. The kit is installed according to below procedure.

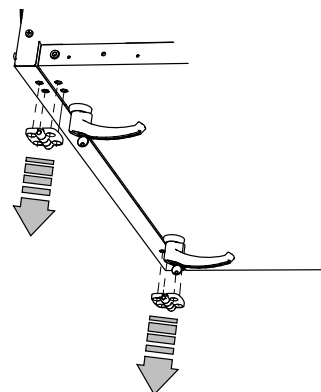
1 Remove guide rails

Open one of the inspection hatches completely and remove the guide rails (pos. 1) supporting the hatch by unscrewing screws, pos. 2 and pos. 3.



2 Hinges

Close the hatch with all 4 handles and unscrew the 2 hinges.

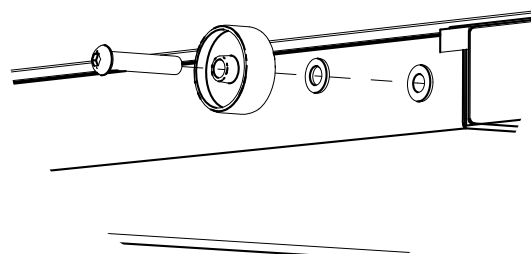


3 Repeat procedure

Repeat the procedure from step 1 on the other hatch.

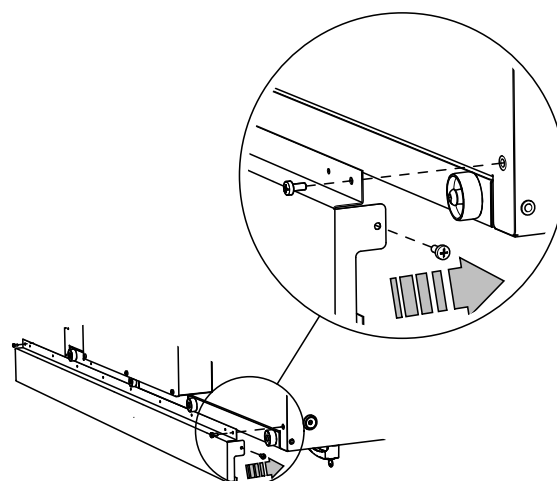
4 Mount the wheels

Mount the wheels in the prepared threaded inserts on the side of the inspection hatch with the enclosed screws and washers.



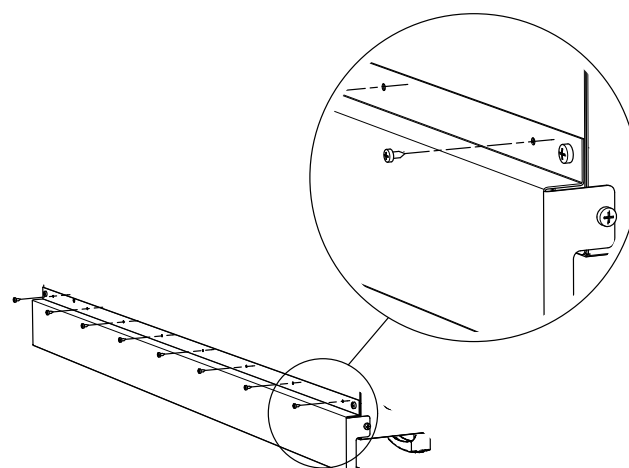
5 Sliding door support rails

Mount the sliding door rails on each side of the unit. Fasten it to the casing with screws in the prepared threaded inserts.



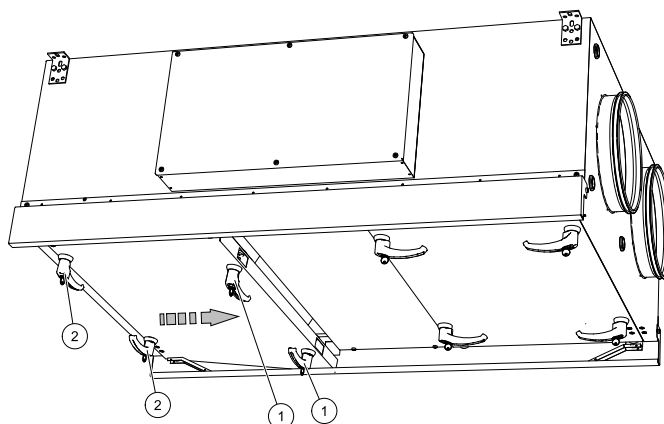
6 Fasten with BSS screws

Fasten the rail to the side of the casing with the enclosed BSS screws.



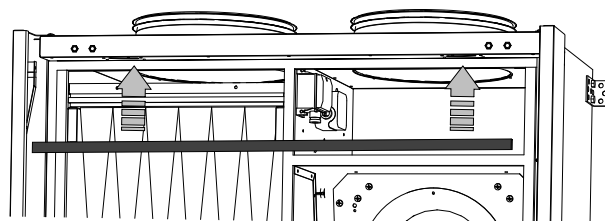
7 Open hatch

Open the hatch by unlocking the 2 inner handles (pos. 1) followed by the 2 outer handles (pos. 2). The hatch can now be pushed toward the centre of the unit. Only one hatch at the time can be opened like this.



8 Apply seal

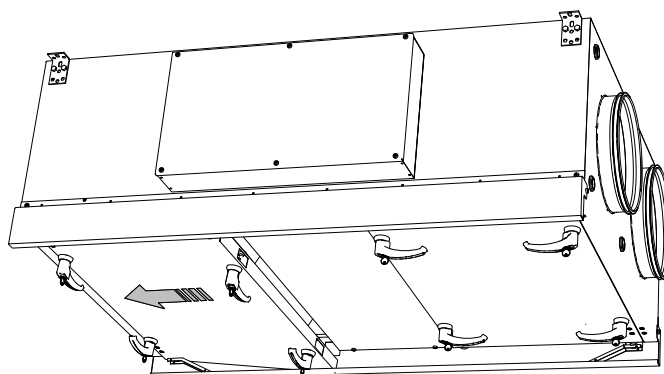
Apply the enclosed self adhesive seal strip to the inner frame of the unit casing.



9 Close hatch

Close the hatch with the 4 handles. Make sure the hatch closes properly.

Repeat the procedure from step 7 on the other hatch.



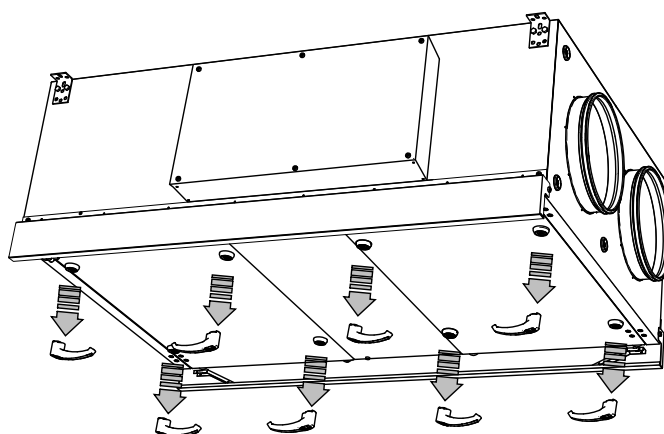
10 Remove Handles

After the hatch is closed, the handles need to be removed before the unit is put in operation.



Warning

The door handles are only intended to be used during the installation. Handles must be removed before the unit is put into operation to ensure the required level of safety for the unit.



4.7 Mounting of Water heating battery

Note:

Applies to units without re-heater!

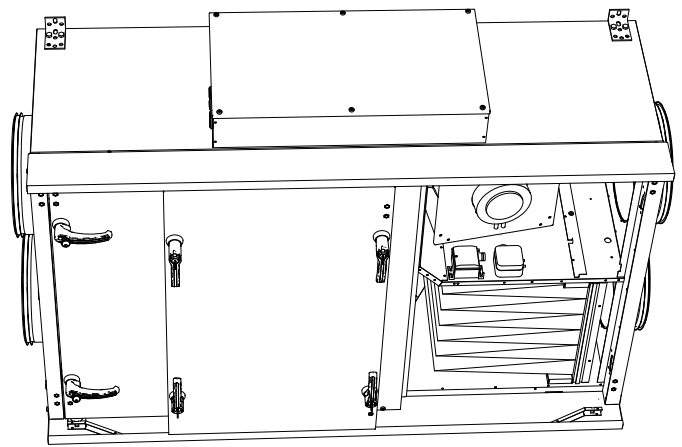
It is possible to add a water heating battery to units without re-heater (None). A water heating battery can be acquired as an accessory.

The following procedure describes how to mount and connect the water heating battery in the unit

4.7.1 HW installation in Topvex FR03–11

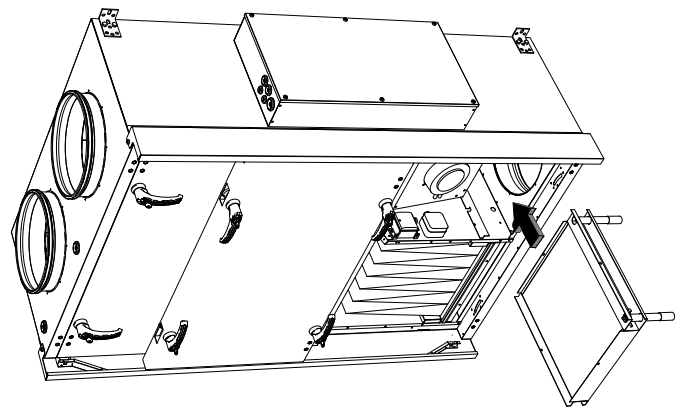
1

Open the inspection door at the supply/extract air side of the unit.



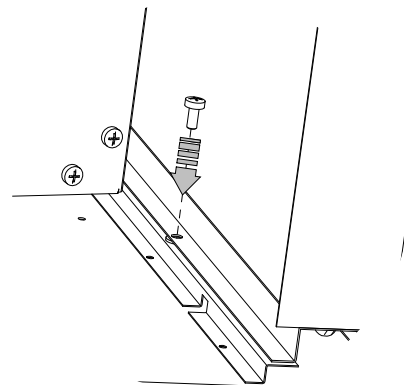
2

Insert the water heating battery in front of the supply air fan and push the connection tubes through the prepared holes in the unit gable. Choose vertical or horizontal positioning of the water coil.



3

Fasten the frame of the water heating battery with 2 screws in the prepared threaded inserts



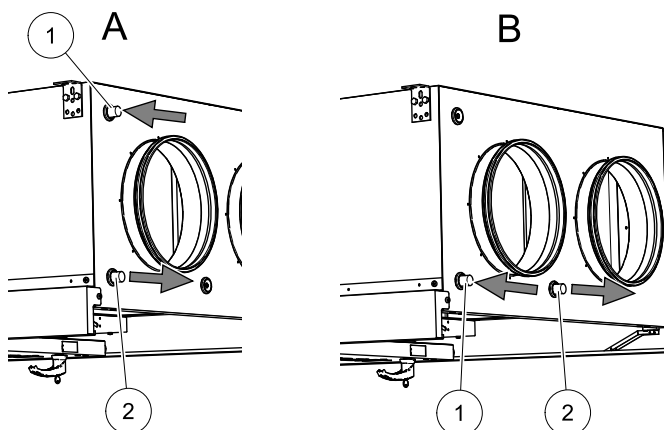
4

The water heating battery can be mounted either vertically (A) or horizontally (B)

Connect the water piping to the threaded connections (pos.1 and 2).

The tubes have hexagonal connectors which are internally threaded (15R 1/2" outer thread).

The arrows in the figure display how the hot water should be connected to the battery. Connect the hot water inlet to the tube connection marked pos.1 in the figure, and the return water to the connection marked pos. 2.



Note:

The unit in the illustration is installed with the inspection doors facing downward, i.e. false ceiling installation



Caution

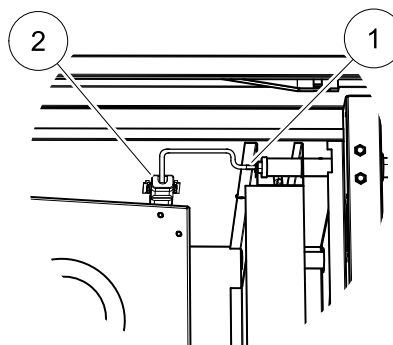
Take care not to damage the water battery when connecting water pipes to connectors. Use a spanner to tighten the connection.

5

Connect the frost protection sensor (pos. 1) to the prepared fast coupling (pos. 2) on the inside casing wall (wires are polarity independent).

Note:

The frost protection sensor is placed on the return water tube.

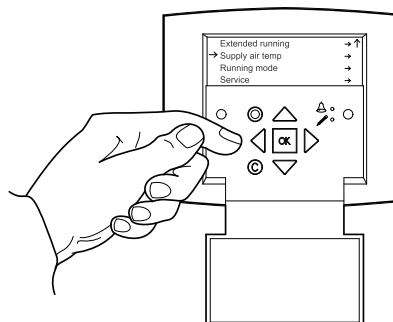


6

Connect all necessary accessories such as water valves and valve actuators. See enclosed wiring diagram for more information.

7

Use the control panel to configure the unit for water heating (chapter 4.7.2).



4.7.2 Configuring the software for water heating

After all the physical installations for water heating have been done the unit software needs to be setup for water heating by the use of the control panel. This is done by activating the analogue input where the frost protection sensor has been connected and set the heating option to `Water`.

Follow below procedure.

1 Access rights

Go to `Access Rights` with the UP/DOWN arrow buttons and press Right with the right arrow button

```
Temperature
Air control
Time settings
→Access Rights
```

2 Log on

Choose `Log on`, press Right

```
→Log on
Log off
Change password
```

3 Password

Enter password `3333` by pressing OK followed by the UP/DOWN buttons. Choose next digit by pressing the Right arrow button followed by OK when all 4 digits are put in.

```
Log on
Enter password xxxx
Actual level: None
```

Go back 2 steps with the Left arrow button

4 Configuration menu

Go to `Configuration` and press Right

```
Man/Auto
Settings
→Configuration
Access Rights
```

5 Inputs/Outputs

Go to `Inputs/Outputs` and press Right

```
→Inputs/Outputs
Control function
Fan control
Extra Sequence Y4
```

6 Universal input

Go to `Universal inputs` and press Right

```
Analogue inputs
Digital inputs
→Universal inputs
Analogue outputs
```

7 Frost Protection

Go to Universal input 3 and change the AI sign: to Frost protection by pressing OK followed by the UP/DOWN arrow buttons, confirm with OK.

Go back 2 steps with the Left arrow button.

Universal input 3

Choose AI or DI sign

AI sign: Frost protection

DI sign: Not used

8 Heating

Go to Heating and press Right

Fan control

Extra Sequence Y4

→**Heating**

Exchanger

9 Water

Press OK followed by UP/DOWN buttons until Water is displayed. Confirm by pressing OK.

Go back 2 steps to the main menu with the Left arrow button and up to the start screen with the UP/DOWN arrow buttons.

Heating

Water

The unit is now ready to be used with the installed water heating battery.

4.8 Connections

4.8.1 Air connection principles

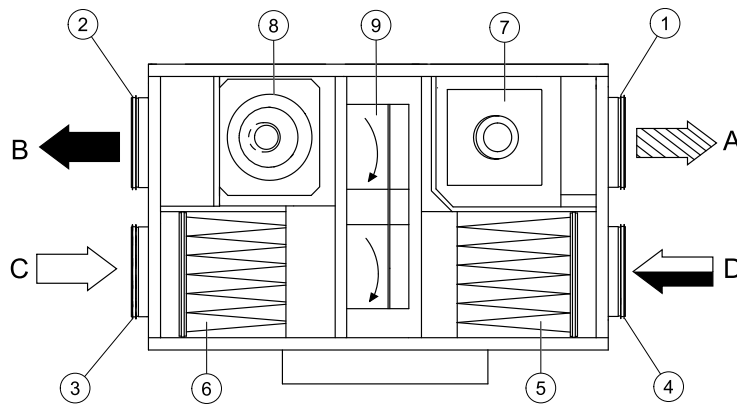


Fig. 10 Right hand connected unit

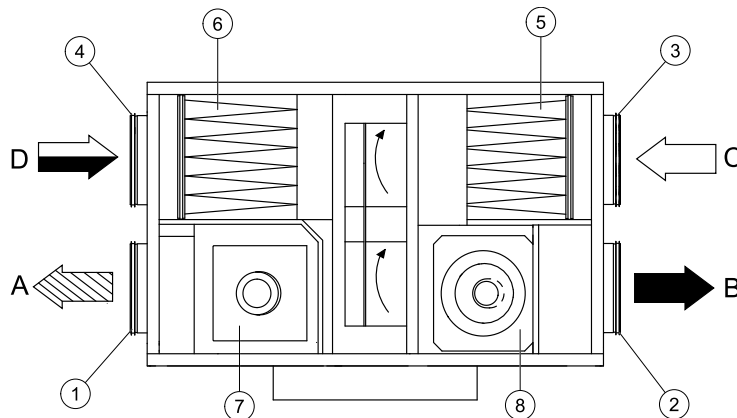


Fig. 11 Left hand connected unit

Table 3: Symbols and descriptions

Position	Description	Symbol
A	Supply air	
B	Exhaust air	
C	Outdoor air	
D	Extract air	
1	Connection supply air	
2	Connection exhaust air	
3	Connection outdoor air	
4	Connection extract air	
5	Filter supply air	
6	Filter extract air	
7	Fan supply air	
8	Fan extract air	

4.8.2 Condensation and Heat Insulation

Outdoor air duct and discharge ducts must always be well insulated against condensation. Correct insulation installation on ducts connected to the unit is especially important. All ducts installed in cold rooms/areas must be well insulated. Use insulating covering (minimum 100 mm mineral wool) with plastic diffusion barrier. In areas with extremely low outdoor temperatures during the winter, additional insulation must be installed. Total insulation thickness must be at least 150 mm.

Caution

- If the unit is installed in a cold place make sure that all joints are covered with insulation, and tape well
- Duct connections/duct ends should be covered during storage and installation
- Do not connect tumble dryers to the ventilation system

4.8.3 Silencers

To avoid fan noise being transferred via the duct system, silencers should be installed both on supply and extract air.

To avoid noise being transferred between rooms via the duct system and also to reduce noise from the duct system itself, installation of silencers before every inlet diffuser is recommended.

4.8.4 Electric connections

All electric connections are made in the electrical connection box which can be found on the long side of the unit (figure 12). The hatch is removed by unscrewing six screws as displayed in below figure (figure 12).

The unit must not be put into operation before all the electrical safety precautions have been read and understood. See the enclosed wiring diagram for internal and external wiring.

All external connections to possible accessories are made to terminals inside the electrical connection box (table 4).

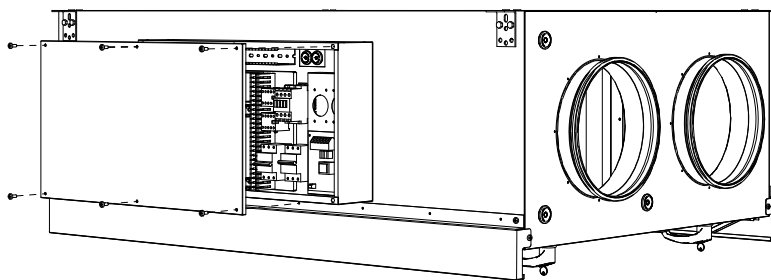


Fig. 12 Opening the electrical connection box

Danger

- Make sure that the Mains supply to the unit is disconnected before performing any maintenance or electrical work!
- All electrical connections must be carried out by an authorized installer and in accordance with local rules and regulations.

Warning

The units electrical connection to the mains supply must be preceded by an all pole circuit breaker with a minimum 3 mm gap must.

4.8.4.1 Electrical connection box, Components

Topvex FR03–11 are equipped with a built in regulator and internal wiring (figure 13).

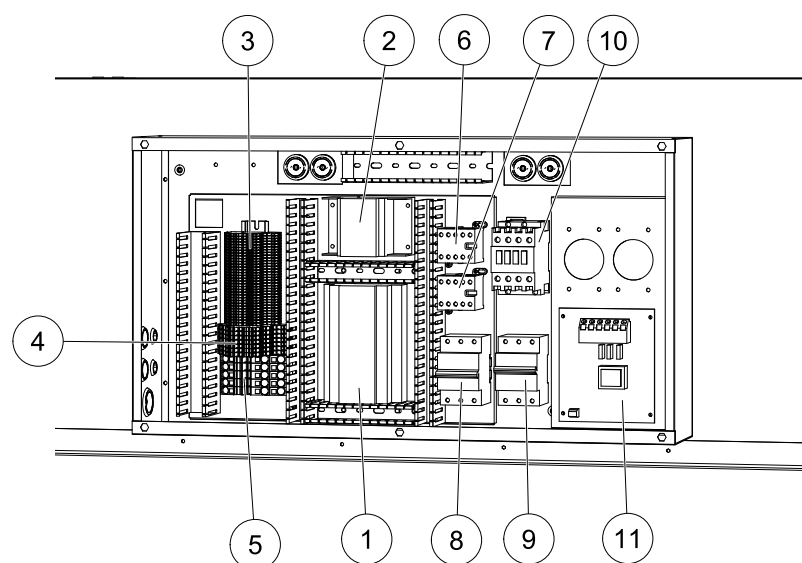


Fig. 13 Electric components

Position	Description
1	Regulator E-28
2	Transformer 230/24V AC
3	Terminals for internal and external components
4	Terminals for internal wiring
5	Terminals for mains supply to the unit
6	Contactor (K1) On/Off rotor motor
7	Contactor (K2) On/Off Pump control water (HW units only, not present in EL-units)
8	Automatic fuse
9	Automatic fuse for heater
10	Contactor (K3) for on/off control of EL heater
11	TTC EI heater control

4.8.4.2 External connections

Table 4: Connections to external functions

Terminal block		Description	Remark
	PE	Ground	
N	N	Earthed neutral (supply voltage)	
L1	L1	Phase (supply voltage)	Used for phase 230V 1~ if the unit has this mains supply 400V 3~/230V 3~

Connections to external functions cont'd

Terminal block		Description	Remark
L2	L2	Phase (supply voltage)	400V 3~/230V 3~
L3	L3	Phase (supply voltage)	400V 3~/230V 3~
1	G0	Reference (Water valve actuator mains supply)	24V AC For units with installed water heater only
2	G	Mains supply (Water valve actuator)	24V AC For units with installed water heater only
10	DO ref	DO reference	G (24V AC)
11	L1	Circulation pump hot water system	230V AC For units with installed water heater only
12 ¹	DO 2	Outdoor/Exhaust air damper	24V AC Max. 2,0 A continuous load
14 ¹	DO 4	Cooling pump	24V AC For units with installed water cooler only
15 ¹	DO 5	DX Cooling step 1	24V AC For units with installed DX cooler only
16 ¹	DO 6	DX Cooling step 2	24V AC For units with installed DX cooler only
17 ¹	DO 7	Alarm output for DO signals	24V AC
30	AI Ref	Supply air sensor reference	Neutral
31	AI 1	Sensor supply air	
40	Agnd	UI reference	Neutral
41 ²	UAI 1/(UDI 1)	Pressure transmitter extract air	Connected to external pressure sensors in case of VAV control
42 ²	UAI 2/(UDI 2)	Pressure transmitter supply air	Connected to external pressure sensors in case of VAV control
44	UAI 3/(UDI 3)	Frost protection sensor water heating battery	Use terminal 40 as reference
4 ³	DI ref	Extended running/Fire alarm reference	+ 24V DC
50	B	Exo-line B	Modbus, Exo-line connection
51	A	Exo-line A	Modbus, Exo-line connection
52	N	Exo-line N	Modbus, Exo-line connection

Connections to external functions cont'd

Terminal block		Description	Remark
53	E	Exo-line E	Exo-line connection
57	+	LON +	LON connection (option)
58	-	LON -	LON connection (option)
59	Egnd	LON Egnd	LON connection (option)
71 ³	DI 1	External alarm	Normally open contact Use terminal 4 as reference
74 ³	DI 4	Extended running	Normally open contact Use terminal 4 as reference
75 ³	DI 5	Fire alarm	Normally open contact Use terminal 4 as reference
76 ³	DI 6	External stop	Normally open contact Use terminal 4 as reference
90	Agnd	AO Reference	Neutral
93	AO 3	Control signal TTC, Electrical Heating	0–10V DC
94	AO4	Control signal valve actuator, Cooling	0–10V DC

1. Maximum current load for all DO combined: 8A
2. Connection to external pressure sensor in case of pressure controlled unit (VAV)
3. These inputs may only be wired to voltage free contacts

4.8.4.3 BMS Connection

Exo-line, Modbus and optional LON connections are to be connected to the following terminals:

- RS485(Modbus): 50-51-52
- RS485(Exo-line): 50-51-52-53
- LON: 57-58-59

RS-485 contact and Exo-line via TCP/IP (WEB) are included as standard (figure 14).

Note:

RS-485 port and TCP/IP port can not be used simultaneously! I.e. possible communications are Modbus or Exo-line via RS-485 or Exo-line (WEB) via TCP/IP.

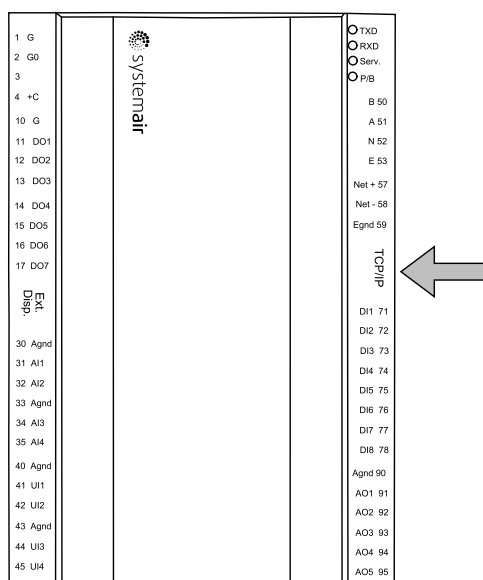


Fig. 14 BMS connection on the controller

5 Installing the Control Panel

5.1 Dimensions

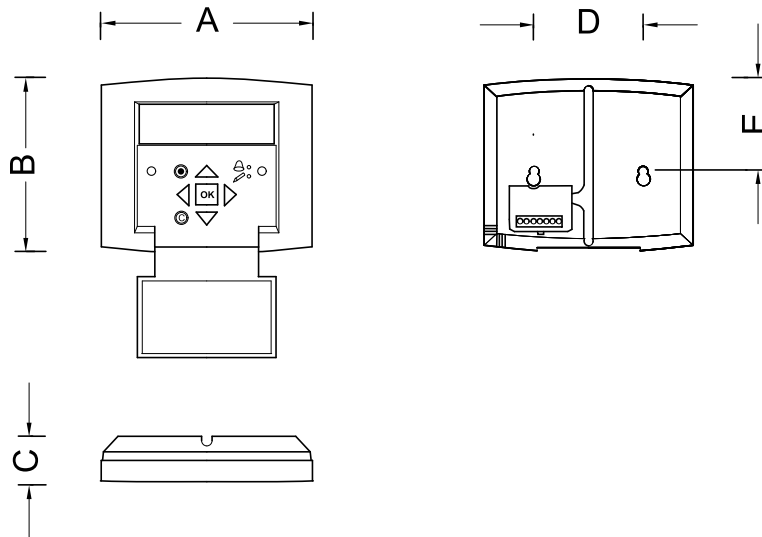


Fig. 15 Control panel dimensions

Position	Dimensions in inches (mm)
A	4.5 " (115.0)
B	3.7" (94.0)
C	1.0" (26.0)
D	c/c 2.4 (60.0)
E	2.0 (50.5)

5.2 General information

The control panel is delivered connected to the Corrigo control unit situated in the electrical connection box. Cable length is 32.8 ft. (10 m). In case the control panel needs to be detached from the signal cable it is possible to loosen the wires on the back of the control panel (figure 16).

A set of self-adhesive magnet strips are included in the package to facilitate installation on a metal surface.

5.3 Installation

1

Find an appropriate place to install the control panel. Maximum length between control panel and unit is 32.8 ft. (10 m). as standard.

2

If needed, drill two holes in the wall to hang the control panel (centre to centre: 2.4" (60 mm)) (pos.1, figure 16).

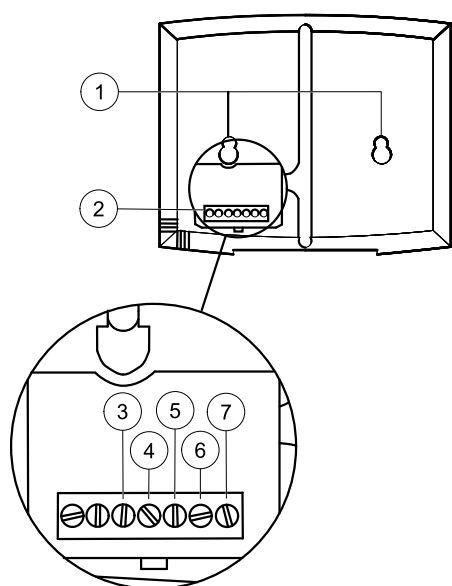


Fig. 16 Control panel wire connections

Position	Description
1	Mounting holes
2	Connection block
3	Connection to yellow cable
4	Connection to orange cable
5	Connection to red cable
6	Connection to brown cable
7	Connection to black cable

6 Additional Equipment

For information concerning additional external equipment such as valve actuators, motorized dampers, E-tool, roof units, wall grilles etc. see technical catalogue and their enclosed instructions.

For electrical connections of external components see enclosed wiring chart.

Systemair AB reserves the right to make changes and improvements to the contents of this manual without prior notice.



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